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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	Examiner: James Phan
MANABU KATO	)	
	:	Group Art Unit: 2872
Appln. No.: 08/951,635	)	
	:	
Filed: October 17, 1997	)	
	:	
For: SCANNING OPTICAL APPARATUS	)	
	:	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SECOND DECLARATION UNDER 37 C.F.R. § 1.132 OF DUNCAN T. MOORE

Sir:

I, Duncan T. Moore, hereby declare:

Introduction and qualifications

1. I executed a Declaration Under 37 C.F.R. § 1.132 in this application on April 1, 2003, and my qualifications are set forth in that paper.

Materials reviewed in connection with declaration

2. In connection with this declaration, I reviewed U.S. Patent No. 5,883,732 (Takada, et al.), a copy of which is attached.

The understanding of the artisan of September 6, 1994

3. Unless stated otherwise, each statement herein, including those made in the first person, represents the understanding of one having ordinary skill in the art as of September 6, 1994 (hereinafter, the "artisan").

Takada, et al.

4. Turning to Takada, et al.'s claims, I note that Claim 1 reads as follows:

> 1. In an optical scanner having a source of a light beam, a deflector for deflecting said light beam and an imaging lens that focuses the deflected light beam to form a beam spot on a surface to be scanned, the improvement wherein the curvatures in a sub-scanning direction of at least two of the surfaces of said imaging lens vary continuously along a main scanning direction over the effective area of said imaging lens and independently of the curvatures in the main scanning direction, and wherein the curvatures in the main and sub-scanning directions are non-symmetrical with respect to the optical axis.

5. As can be seen, Claim 1 requires that "the curvatures in the main and sub-scanning directions are non-symmetrical with respect to the optical axis" (hereinafter, the "Claim 1 recitation").

6. The Claim 1 recitation refers to a form of rotational asymmetry, i.e., the curvature in the main scanning direction is not equal to the curvature in the sub-scanning direction, and not to plane symmetry.

7. In support of this conclusion, I would like to present the following points.

8. First, the language itself suggests that a form of rotational asymmetry is intended.

9. In particular, the asymmetry recitation includes the words "with respect to the optical axis", i.e., the reference of the non-symmetry is a line, not a plane.

10. When specifying rotational asymmetry it is sufficient to refer to a line, whereas when specifying plane asymmetry, it is necessary to refer to a plane and to identify the orientation of the plane.

11. Secondly, Takada, et al. states that:

> even with lens surfaces that vary continuously in the curvature in the sub-scanning direction, the curvatures in the main and sub-scanning directions will depend on each other if the surfaces are aspheric and symmetric with respect to the optical axis and, therefore, one cannot hold the optical magnification in the sub-scanning direction constant without a sufficient number of the degrees of freedom to achieve simultaneous correction of aberrations in both the main and sub-scanning directions"

(col. 5, lines 55-64 (emphasis added)).

12. Here, Takada, et al. was criticizing surfaces which are "symmetric with respect to the optical axis", i.e., where the curvature in the main scanning direction is equal to the curvature in the sub-scanning direction.

13. Thirdly, and most importantly, none of Takada, et al.'s embodiments implicate plane asymmetry.

14. In more detail, in Takada, et al.'s embodiments, the imaging lens has aspheric surfaces in a cross-section taken in the main scanning direction expressed by the z_i equation below, while the curvature of the imaging lens in the sub-scanning direction varies continuously along the main scanning direction over the effective area of the imaging lens and the curvature is expressed by the U_i equation below:

$$z_i = \frac{y^2 / r_{iy}}{1 + \sqrt{1 - (K_i + 1)(y / r_{iy})^2}} + A_i y^4 + B_i y^6 + C_i y^8 + D_i y^{10}$$

$$U_i = U_{ix} + A_{ix} y^2 + B_{ix} y^4 + C_{ix} y^6 + D_{ix} y^8 + E_{ix} y^{10}$$

(col. 9, lines 18-42).

15. From these equations and the numerical tables in Takada, et al., it can be seen that the imaging lens surfaces are rotationally asymmetric with respect to the optical axis — here, the radius of curvature in the plane containing the optical axis and the main scanning direction is not equal to the radius of curvature in the plane containing the optical axis and the sub-scanning direction.

16. However, each such surface is plane symmetric with respect to the plane containing the optical axis and the main scanning direction.

17. And each such surface is plane symmetric with respect to the plane containing the optical axis and the sub-scanning direction.

18. Neither the embodiments nor the remainder of Takada, et al. teaches plane asymmetry for those surfaces.

19. Therefore, the Claim 1 recitation should be read to refer to rotational asymmetry, not plane asymmetry.

20. Indeed, if the Claim 1 recitation were construed to require plane asymmetry, it would be inconsistent with, and unsupported by, Takada, et al.'s specification.

Conclusion

21. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: July 23, 2005
(Month/Day/Year)

Duncan T. Moore

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